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ABSTRACT

Employees who "blow the whistle" on their company because they believe it is engaged in practices that are illegal, immoral, or harmful to the public, often face grave consequences for their actions, including demotion, harassment, forced resignation, or termination. The case of Allan McDonald and Roger Boisjoly, engineers who blew the whistle on Morton Thiokol's poor management practices when the company agreed to launch the shuttle Challenger even after concerns for safety had been expressed, illustrates the problems involved in whistleblowing. McDonald was reassigned and Boisjoly took disability leave to recover from depression over the Challenger disaster. The whistleblower, if his or her charges are correct, characterizes one of the dilemmas of complex organizations: how to restrict the flow of information up the organizational hierarchy and still insure that accurate, useful information reaches organizational decision makers. NASA has since instituted an anonymous whistleblowing system, retaining an outside firm to investigate the claim before it reaches NASA personnel. However, it is naive to think that "a message sent is a message received," and it does not appear as though the new system will avert such disasters as the Challenger explosion. (Fifty-one references are included.) (JC)

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Where Were the Whistle Blowers? The Case of Allan McDonald and Roger Boisjoly

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By now, the chronology is familiar to anyone who has been following the media accounts of the investigation into the cause of the explosion of the space shuttle Challenger on January 28, 1986. (An expanded version of this chronology is found in Rogers, 1986).

January 31, 1985 - Six months before the Challenger accident, Roger Boisjoly, an engineer working for Morton Thiokol, the manufacturer of the rocket booster, writes a memo to the vice president of engineering which is signed by Boisjoly's supervisor. The memo warns of problems with the O-rings that hold the solid rocket booster together and concludes, "It is my honest and very real fear that if we do not take immediate action to dedicate a team to solve the problem, with the field joint having the number one priority, then we stand in jeopardy of losing a flight, along with all the launch pad facilities" (Reichhardt, 1986).

January 27, 1986 - Allan McDonald, manager of the solid rocket motor project for Morton Thiokol, is at the Kennedy Space Center in Florida and receives a phone call from an engineer in the company's Utah office expressing concern about the solid rocket booster field joints in the cold weather occurring in Florida at that time. McDonald passes his concern to the Marshall Space Flight Center (MSFC) in Huntsville, Alabama. After a number of phone calls between Marshall and Thiokol employees, a telephone conference among engineers and managers in Florida, Alabama, and Utah is set up for that evening.

The teleconference begins at 8:45 PM. Roger Boisjoly uses charts to explain his deep concern about launching in temperatures that are "outside the previous base of experience" (Reichhardt, 1986). Thiokol management asks for a short caucus and discusses the launch without NASA management listening.

After a thirty minute conference, Thiokol management comes back on the line and agrees to the launch. McDonald continues to argue for a delay. McDonald refuses to sign off on the launch, an unprecedented move in 24 previous launches (Brody, 1986). NASA management asks Thiokol to put its recommendation in writing. Joe C. Kilminster, vice president of space booster programs, faxes Thiokol's recommendation to launch to NASA at 11:45 PM.

January 28, 1986 - The space shuttle Challenger is launched in temperatures 15 degrees colder than in any previous launch. It explodes 73 seconds after launching due to a failure in the field joint (O-ring) on the right solid rocket booster.

February 3, 1986 - President Reagan appoints a blue ribbon panel known as the Rogers commission to investigate the Challenger accident.

February 10, 1986 - In a closed meeting, the commission discusses an internal NASA memo from 1985 warning that flight safety was being compromised by the potential failure of the booster rockets. Morton Thiokol engineer Allan McDonald, manager of the booster rocket motor project, steps voluntarily out of the audience to say: "Mr. Chairman, you ought to be aware that some of us didn't want to launch." He explains that he and other company engineers feared that cold weather would allow the booster rocket joints to leak.

February 19, 1986 - In a public hearing, McDonald tells the commission that he feared cold weather would affect the seals. McDonald said he was overruled by Morton Thiokol managers, who gave NASA written approval for the launch.

February 25, 1986 - McDonald tells the commission that NASA officials objected when Morton Thiokol initially opposed launching the shuttle. He says the usual system of the contractor having to prove the vehicle was safe was reversed and this time the engineers were asked to prove it was not safe.

Thiokol engineer Roger Boisjoly tells the commission about his 1985 memo in which he had written that unless the seals were improved "the result would be a catastrophe of the highest order loss of human life."

March 1986 - McDonald is reassigned from a key assignment at Morton Thiokol. He claims that Lawrence Mulloy "burst into his office" and expressed anger that McDonald was relaying complaints about NASA's invesitgation of the accident to the Rogers commission without first reporting it to Morton Thiokol or NASA (Joyce, 1986).

June 3, 1986 - After complaints from Congress, McDonald and boisjoly are reinstated. McDonald is assigned to head the booster rocket redesign task force. Boisjoly continues on disability leave claiming that he suffers from depression.

May 17, 1986 - McDonald, in his new role as Thiokol spokesperson, calls the first full-scale test-firing of a space shuttle booster rocket since the Challenger disaster a "major milestone" and says it will give company employees a morale boost. He is quoted in an AP wire service report: "It was absolutely jubilant for me. There were times when I wondered if it would ever happen. We have taken a bashing from the press and everyone else who have given the impression we couldn't get anything right. This proves them wrong. We can do something right" (White, 1987).

June 1986 - As the manager in charge of a rocket redesign task force, McDonnald testifies before a House Science and Technology Committee on behalf of the work Morton Thiokol is doing to redesign the booster rocket.

January 28, 1987 - Roger Boisjoly files suit against Morton Thiokol on behalf of U.S. taxpayers for $1 billion. He charges that the company knowingly provided NASA with defective solid rocket motors for the shuttle rocket that exploded January 28, 1986. Boisjoly contends that Morton Thiokol failed to hire quality control and safety personnel with funds provided by NASA, using the money instead as a "slush fund for Thiokol." He alleges that Thiokol falsely certified that O-ring seals in the rocket boosters were safe although the company knew nearly a year before the disaster that the seals did not function properly at temperatures of 50 degrees. He also files a $1 million suit on behalf of himself charging that Morton Thiokol impugned his professional reputation and threatened his job to punish him for testifying before the Rogers commission and congressional committees that investigated the Challenger accident (Boffey, 1987).

Since the Challenger accident, many theories have been proposed to explain why no one listened to the concerns expressed by Morton Thiokol engineers and delayed the launch. These theories include "chronic failure in the space agency and among its contractors to communicate life-and-death problems up the chain of command" (Sanger, 1986), a "Russian roulette mentality" that meant that NASA managers felt that they "got away with it last time" so they could continue to lower their standards (Boffey, 1986), a management structure that allowed "Marshall engineers at the booster project level to make decisions with sweeping flight safety implications without those decisions being reviewed in depth by shuttle launch and flight operations" (Covault, 1986), pressure from the news media (Wellborn, 1986), and poor judgment because of excessive overtime and fatigue (Covault, 1986).

No matter what the cause of the decision to launch the Challenger, it is clear that there were concerns about the safety of the booster rocket seals as early as 1981. Unfortunately, these concerns were never made clearly or dramatically enough to cause NASA management to consider delaying launching the space shuttle. Since the accident, there has been considerable media attention focused on this process. For example, syndicated columnist Mike Royko (1986) wondered why no one went outside the organizational structure of NASA or its contractors to say: "Something is wrong and maybe the rest of the country ought to know about it."

Several theories of organizational communication can help us understand this process.

EXIT AND VOICE

Hirschman (1970), an economist, proposes that the management of an organization finds out about its failings through two alternative routes: exit and voice. The exit option occurs when organizational employees leave their jobs; the voice option occurs when employees express their dissatisfaction directly to management (i.e., upward communication), or to some authority to which management is subordinate or through general protest addressed to anyone willing to listen. Voice is a communicative strategy which involves:

> any attempt at all to change, rather than escape from, an objectionable state of affairs, whether through individual or collective petition to the management directly in charge, through appeal to a higher authority with the intention of forcing a change in management or through various types of actions and protests, including those that are meant to mobilize public opinion. (Hirschman, 1970, p. 30).

In other words, by exercising voice, employees attempt to change an organization instead of escape from it. According to this theory, users of voice must alert management to its failures and then give them time to correct the situation.

Theoretically, voice is the preferred strategy for exerting change within organizations because once an employee has exited, he or she loses the power to use voice. Thus, exit is generally "a reaction of last resort after voice has failed" (Hirschman, 1970, p. 37). According to Hirschman, voice is clearly preferred to exit when: (1) employees undergo the sacrifice of staying because they feel that they want and are able to do something about a situation and can only exert this influence if they stay; (2) employees expect that the complaints of others plus their own faithfulness will be successful; (3) it is too costly to leave and then decide to come back again; and (4) employees are loyal to the organization.

Voice is, in essence, responsible dissent occurring through the exercise of free speech within an organization (Stanley, 1981). Yet, Blumberg (1973) and Ewing (1977) cite court decisions indicating that Americans do not have the same rights, such as freedom of the press, speech and due process, at work as they do at home. This "rightlessness" is most conspicuous for employees who work in the private sector and do not belong to unions (McIntire & McIntire, 1971; Stone, 1975; Wade, 1973; Westin, 1981) and stems, in part, from the belief that the employer and employee are "equal partners to the employment agreement. Just as the employee is free to resign whenever he or she wants, so the employer is free to show him or her the door whenever it desires" (Ewing, 1977, p. 33). The assumption behind the legal notion of freedom of contract is that an employee can leave a firm and find comparable employment with little difficulty (Ewing, 1977). Nonetheless, as Blades (1967) points out: "It is the fear of being discharged which above all else

renders the great majority of employees vulnerable to employer coercion" (p. 1406). He maintains that "only the unusually valuable employee has sufficient bargaining power to obtain a guarantee that he will be discharged during a specified term of employment only for 'just cause'" (pp. 1411-1412). The great majority of employees are viewed as expendable. Thus, an employee's threat to quit a job (use the exit option) has little power to bring about change in an organization.

Generally, voice is used only when employees feel that they can influence their organizations. Thus, dissatisfied employees may stay with a deteriorating organization based on: (1) their evaluation of their chances of changing the organization's actions through their own actions or through the actions of others and (2) their judgment that it is worthwhile to trade the certainty of something that is available here and now for the chances taken by leaving the organization. Employees who have nowhere else to go and employees who are loyal to their organizations, theoretically, will be maximally motivated to express their dissatisfaction to management by using the voice option. Without feelings of loyalty, exit is costless; and, if employees have a low estimate of their ability to influence their organization, they will exit in silence.

Morton Thiokol engineers clearly used the voice strategy a number of times within their organization. There is a great deal of evidence that Roger Boisjoly and other engineers expressed their concerns about the booster rocket seals to Morton Thiokol management as early as 1981. Morton Thiokol and NASA management felt that the problem was serious enough to institute a redesign of the seals, but not serious enough to delay a launch. Boisjoly actually did express his concerns outside of his organization. In October 1985, he attended a meeting of a committee of the Society of Automotive Engineers and asked for their help in redesigning the seals ("Challenger's o-rings). The members of the committee felt that Morton Thiokol was concerned about the design, but again no one took the information any further.

Broad (1986) maintains that this is because NASA is like a close-knit family. He maintains that "problems stay within; whistleblowers are few. NASA engineers who were aware of the gavity of the seal problem either spoke in whispers among themselves or followed rigid procedures to alert their superiors" (p. C9). Although the engineers raised the issue at every level, month after month, they would never have "gone outside." According to Broad, "few knowledgeable individuals wanted to press questions that could halt the program" (p. C9). No one wanted to be a whistle blower.

WHISTLE BLOWING

Hirschman's (1970) conceptualization of voice does not separate the consequences of communicative strategies directed by employees to immediate supervisors, to people in other levels of

the organizational hierarchy, or to the public. Dissatisfied employees, however, are likely to express their dissatisfaction to their immediate supervisors first (Westin, 1981). If management is unable to satisfactorily answer their concerns, employees may then go outside the formal channels of upward communication within organizations and appeal directly to the public or to a regulatory agency (Stewart, 1980). Employees who voice their dissatisfaction about organizational policies or practices outside the organization, with the intent of changing the policies or practices or warning the public about them, are using a communicative strategy referred to as whistle blowing (Redding, 1985). The basic assumption behind the use of this communicative strategy is that employees who disagree on ethical grounds with their employers about organizational policy or practices should not exit, but should speak out (Ewing, 1977; Walters, 1975). This response is a relatively recent communicative strategy used to effect change in organizations.

According to Nader, Petkas and Blackwell (1972), whi[illegible]e blowing is:

> the act of a man or woman who, believing that the public interest overrides the interest of the organization he serves, publically "blows the whistle" if the organization is involved in corrupt, illegal, fraudulant, or harmful activity. (p. vii)

In other words:

> An employee "blows the whistle" on a company when, knowing the company is engaged in serious unethical activity and having made reasonable but unsuccessful efforts to get the company to desist by working from within, the employee chooses to disclose the information to the public. (Velasquez, 1982, p. 325)

Thus, whistle blowers are federal employees (Dudar, 1977) or employees of private sector corporations who challenge organizations "who appear to be engaged in illegal, immoral, or irresponsible activity" (Nader, Petkas, & Blackwell, 1972, pp. 76-77). In general, whistle blowers are employees who believe they can best exert upward pressure for change and rectify unethical behavior in business or government by making their charges and identity public (Lublin, 1976). Walters (1975) notes that "having decided at some point that the actions of the organization are immoral, illegal, or inefficient, [they act] on that belief by informing legal authorities or others outside the organization" (p. 26). Whistle blowing is, thus, an indication that "the rules and guidelines for resolving disputes and failures within an organization have been insufficient" (Peters & Branch, 1972, p. 291) and that the situation is so serious it demands public attention. In other words, in the eyes of the whistle blower, the organizational system for communicating and resolving problems has broken down (Redding, 1985).

Whistle blowing has been encouraged in both the private and public sector. To encourage whistle blowing, in the spring of 1975, the Committee on Scientific Freedom and Responsibility of the American Association for the Advancement of Science (AAAS) issued a report urging scientists and engineers to blow the whistle on their employers when they saw their work being used for "morally dubious ends" (Ewing, 1977, p. 184). In the same year, Senator Edward Kennedy "sponsored hearings . . . to publicize the cause of government employees who spoke out against illegal or immoral actions in their agencies" (Ewing, 1977, p. 77).

Although the AAAS and the Kennedy hearings encouraged conscious acts of whistle blowing, Dudar (1977) maintains "most people who wind up in the fraternity [of whistle blowers] begin almost accidently, expecting gratitude and encountering, instead, a stone wall of either indifference or hostility" (p. 52). Apparently, much of the whistle blowing which does occur results from organizations' unresponsiveness to employees (Walters, 1975). For example, in a study of university students, Turner (1973) reports students "believed their freedom of expression was impaired, not because anyone actively prevented them from speaking, but because no one would listen, understand, or care" (p. 1). In other words, most organizations do not actively prevent employees from expressing their dissatisfaction but management is not actively encouraged to respond to dissatisfaction when it is expressed. Whistle blowers are members of the increasingly educated, demanding and powerful work force who feel that management will not listen to or respond to what they view as legitimate concerns.

The lack of appropriate listening strategies in organizations is a common phenomenon. Several writers have indicated indirectly that managers are unresponsive to employee concerns. For example, Silver (1967) claims most employee complaints are "insubstantial," while Thompson (1953) claims most managers feel employees will see that management is "right" if they are given "the facts." Walters (1975) believes managers should respect employees' rights to disagree with organizational policy not because it is the employees' fundamental right, but because it is in the best interests of the organization. These writers imply that employees who expect a response from management are violating the communicative norms within organizations. More directly, D'Aprix (1977) maintains:

> in a highly traditional organization, communication is ritualized. . . . There is considerable emphasis on communication up and down a chain of command. The worker is not permitted to air his grievances to his boss's boss without first seeking permission and approval. (pp. 29-30)

Most employees usually do seek approval first (Boulden, 1975; Walters, 1975; Westin, 1981). Employees only communicate their dissatisfaction outside organizational boundaries when their ideas are met with repeated "bureaucratic runarounds, deaf ears,

or hostility" (Walters, 1975, p. 30).

Employees who choose such a communicative strategy of last resort face negative consequences. In an often-quoted attack, James M. Roche, Chairman of General Motors Corporation, states:

> Some of the enemies of business now encourage an employee to be disloyal to the enterprise. They want to create suspicion and disharmony and pry into the proprietary interests of the business. However this is labeled--industrial espionage, whistle blowing, or professional responsibility--it is another tactic for spreading disunity and creating conflict. (cited in Flint, 1971, p. 52)

Even when managers recognize the legitimacy of breaking the chain of command for organizational communication, many react as does Dr. Arthur Bueche, Vice President for Research with General Electric, who notes how difficult it often is "to distinguish between those who are blowing the whistle and those who are crying wolf" (Ewing, 1977, p. 227). Bueche believes that employees who choose to make a "public attack" on their organization should be willing to resign (Wilford, 1976). Drucker (cited in Orr, 1981) equates whistle blowing with "informing."

Thus, Boulden (1975) warns that "any effort to . . . speak out against company practices, will be interpreted by your employers and fellow workers as disloyalty and near treason" (p. 43). He contends that whistle blowing almost never has a positive effect on a person's career, and the "odds are that management will not only attempt to brand your statements as falsehoods, but may also attack your veracity and competence" (p. 44). Peters and Branch (1972) somewhat facetiously describe the typical response to a whistle blowing attempt:

> A whistle-blower's antagonists will probably do something like the following: hand the press a 2,000-page, computer-blessed study by experts in support of their position; cite national security, job protection, or economoic emergency as the justification for their actions; impugn the person with the whistle as an unqualified, self-seeking, disloyal, and moderately unbalanced underling who just doesn't understand the complexities that converge at the top; call for further study of the problem; and retire to dinner with their lawyers. (pp. 15-16)

Often, the whistle blower will be subjected to what Blades (1967) terms "abusive discharge" in which the employee is "discharged as a result of resisting his employer's attempt to intimidate or coerce him in a way which bears no reasonable relationship to the employment" (p. 1413). The abusive discharge is apt to be malicious because, as Ewing (1977) notes: "When a competent employee with years of service is fired for refusing to submit to a boss's improper or over-reaching demands, the boss feels guilt in a way not experienced when firing an employee for

incompetence or laziness" (p. 200). The whistle blower is a threat to the communication structure of the traditional organization and represents a lapse in socialization that may be very distressing to management (Parmerlee, Near, & Jensen, 1982). Stone (1975) suggests: "People who feel . . . threatened by whistle blowing will inevitably seek to 'make an example' of the whistle blower: by firing, demotion, or harassment" (pp. 214-215). An organization may pay some price for the loss of an employee, but an employee is likely to pay the higher price. Ewing (1977) cites a sociologist who has called abusive discharge the "organizational equivalent of capital punishment" (p. 38).

These potential results of whistle blowing pose a dilemma for whistle blowers. They must use a communicative strategy that receives public attention, but must not appear to be gratifying their own egos (Peters & Branch, 1972; Dozier & Miceli, 1985). Their use of voice is more likely to be heard and believed if they appear to clearly lose from their acts. Although they may lose a career, as Peters and Branch (1972) note: "The strength on which whistle-blowers have relied is basically that they have been judged <u>right</u> by most of the people who have studied the conflicts from outside the battle area" (pp. 287-288). Nearly all whistle blowers who have been punished by their organizations win when they challenge their punishment in court (Orr, 1981; Walters, 1975; Westin, 1981).

An examination of 51 different whistle blowing events reported in various sources (Stewart, 1980) reveals consistent patterns of events in pure whistle blowing instances, when the whistle blower is an employee of an organization as opposed to a person who has left the organization (Peters & Branch, 1972). In pure whistle blowing instances, the events occur in the following order (although some steps may be omitted):

Step 1: An organizational employee becomes aware of a product or policy which he or she feels is unethical, immoral, or illegal and/or will endanger the public.

Step 2: The employee expresses his or her concerns to his or her immediate supervisor. The employee perceives that his or her supervisor is not going to act on the concerns.

Step 3: The employee expresses his or her concerns to administrators higher up in the corporate or governmental hierarchy. The employee perceives the administrators are not going to act on the concerns.

Step 4a: The employee takes his or her concerns to a regulatory body (such as a Congressional subcommittee, the courts, the Nuclear Regulatory Commission) which is charged with overseeing the organization or government agency. This step, by definition, makes the employee's concerns public.

and/or

Step 4b: The employee takes his or her concerns to the press, which then publicizes them.

Step 5: The employee is isolated by his or her supervisors (for example, the employee's assistants are taken away and other organizational members are instructed to avoid the employee).

Step 6: The employee is expelled from the organization--he or she is either fired or forced to resign.

No one blew the whistle on potential problem with the O-rings before the Challenger accident. After the accident, however, Allan McDonald came forward at a closed hearing of the Rogers commission to tell them that NASA management was not being accurate in their description of the decision making leading up to the launch decision. Both McDonald and Roger Boisjoly then testified before open hearings of the Rogers commission about their objections to the launch. The whistle blowing incident did not involve the safety of the O-rings, but the fact that NASA management was not accurately reporting the decision-making process leading up to the launch decision. Predictably, the media praised the two engineers calling them "whistle-blowing heroes" (Seltzer, 1986) and "ethical resisters" (Glazer & Glazer, 1986). Even though the whistle blowing incident occurred, in essence, after the fact, Morton Thiokol management reacted predictably and isolated and demoted the two engineers. Due to Congressional pressure, the engineers were restated and McDonald became a spokesperson for the company.

THE NECESSITY FOR WHISTLE BLOWING

The choice between taking a concern up an organizational hierarchy or outside the hierarchy to the public is clearly a choice between communication strategies. Supervisors' responses to these two strategies can be explained, in part, using a perspective drawn from the literature on organizational communication (Stewart, 1980). An organization, by definition and necessity, restricts the amount of information traveling up through the hierarchy (Gibb, 1968; Redding, 1972). When dissatisfied employees attempt to take their concerns through an organizational hierarchy, they are attempting to increase, or at least alter, this upward flow of information. They express their concerns directly to the public when they feel they cannot effectively alter the flow of information or get a suitable response from organizational management. This feeling may result because their supervisors will not pass their concerns to the next level of the hierarchy or because their supervisors do not respond to the concerns in a manner desired by the subordinates. Thus, the crucial issue is the supervisor's decision to transmit information up through an organizational hierarchy, to act on the information in a way which satisfies the subordinate.

Subordinates are likely to pass information to their supervisors if the information is important and favorable (O'Reilly & Roberts, 1974). In general, potential whistle blowers may consider their information favorable because they feel they have discovered an organizational problem which needs to be remedied. Their concern shows that they are conscientious employees. The information is unlikely to be passed up the organizational hierarchy by the supervisor, however, because the information, by definition, is unfavorable to the supervisor. Thus, a supervisor is unlikely to pass negative information to his or her own supervisor (Kelly, 1951; Read, 1962). The supervisor also is unlikely to pass such information upward because supervisors view messages which are favorable to subordinates as less accurate than messages which are unfavorable (Sussman, 1973). Naturally, supervisors are reluctant to pass upward messages which they perceive as likely to be inaccurate.

Given this framework, there is a theoretical potential for whistle blowing any time a subordinate communicates information upward that is perceived to be unfavorable to the supervisor if the supervisor transmits it upward. Of course, in many instances, when a supervisor stops a subordinate's message, the subordinate decides the information is unimportant and gives up. Occasionally, however, the subordinate feels that he or she has discovered something immoral, unethical, or illegal and refuses to keep silent. When the subordinate feels this way, he or she may bypass the communication channels normally associated with the organizational hierarchy--sometimes going outside the organization to the public. Members of the organizational hierarchy are likely to react against him or her, in part, because he or she has publicly demonstrated the ineffectiveness of the organizational communication system. The whistle blower, if his or her charges are correct, illustrates one of the dilemmas faced by all complex organizations--how to restrict the flow of information up the organizational hierarchy and, at the same time, insure that accurate, useful and timely information reaches organizational decision makers.

According to this theory, there is always the danger of management failing to pass on information to higher levels in an organization. As one astronaut notes ("Key points," 1986):

> There is a great bunch of engineering people at NASA. And I guarantee beyond any reasonable doubt that all the working troops right this minute know exactly what all the space shuttle issues are right this minute.
>
> But what we have to worry about is five year from now, when Joe Engineer comes in to the boss and he says, "Hey, how about this data here that shows framistan keeps breaking, it's going to blow the side off the orbiter," and his boss says, "It hasn't failed in 60 flights, get out of my office." (p. D18)

To alleviate this problem, NASA management has instituted a system which they feel will encourage whistle blowing and prevent further decision-making errors (Wilford, 1986). NASA employees can "fill out a form" and mail it to Batelle Memorial Institute in Ohio. Batelle will investigate the claim, remove the employee's name from the form, and forward it to the appropriate NASA official. Concerns the day before a scheduled launch can be telephoned to the launch safety officer. Obviously, NASA is still operating on a "message sent is a message received" model of communication. They seem to have faith that if a decision maker has appropriate information, he or she will reach the appropriate (and safe) conclusion. Unfortunately, previous evidence does not support this conclusion. Fink (1986, February 17) describes the Challenger accident as "a sad series of missed opportunities for assertive action that may or may not have averted the tragedy" (p. 13). Unfortunately, the new NASA whistle-blowing policy does not seem like it will change this fact.

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